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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/894,674 | 06/28/2001 | Holger Leonhardt | A-2773 | 6397 |

24131 7590 02/18/2005
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EXAMINER

PENDERGRASS, KYLE M

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| ART UNIT | PAPER NUMBER |
|----------|--------------|

2624

DATE MAILED: 02/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|---------------------------------------|--|--|
| Office Action Summary | Application No. 09/894,674 | Applicant(s) LEONHARDT, HOLGER | |
| | Examiner Kyle M Pendergrass | Art Unit 2624 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>5/20/02</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what "taking over the nominal distance..." means.

Claims 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 13 recites the limitation "said third, and said fourth optical sensors" in page 29. There is insufficient antecedent basis for this limitation in the claim.

Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 14 recites the limitation "said third optical" in page 29. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loffler (US 6,429,945) & Ohigashi et al. (US 4,965,597).

Regarding claim 1, **Loffler** teaches a method for determining a position of a printing image on a piece of printed material in a printing machine (*column 4:lines 3-4, position of image relative to edge of paper is determined*), which comprises the steps of:

acquiring, by an optical sensor (*fig 1, image scanner 23*), a mark disposed on the piece of printed material (*column 3:line 66 – column 4:line 5, image scanner 23 scans the electrical image, i.e. the entire sheet with marks comprising an image*);

Acquiring, by an optical sensor (*fig 1, image scanner 23*), an edge of the piece of printed material (*column 3:line 66 – column 4:line 5, image scanner 23 scans the electrical image, i.e. the entire sheet with edges of sheets*);

and calculating, by an evaluation unit (*fig 1, steering or control device 14*), a spaced distance of the mark from the edge (*column 4:lines 37-41, evaluation unit 14 computes the exact position of the image with the parameter, i.e. the edge, of the sheet 11. The evaluation unit 14, in column 3:lines 10-13 & column 4:lines 41-43, measures the distance values to compare to a nominal distance*).

Loffler does not teach wherein the sensing of the mark and the edge is accomplished by two separate sensors, one for sensing the mark disposed on the printed material and the other for sensing the edge of the printed material.

However, **Ohigashi et al.** teach one optical sensor for acquiring a mark disposed on a piece of printed material (*column 5:lines 10-16, mark sensor 10 senses registration marks on a recording paper 4*), and another optical sensor for acquiring an edge of the piece of printed material (*column 5:lines 7-10, edge sensor 8 senses edge of a recording paper 4*).

Accordingly, it would have been obvious to one skilled in the art at the time of the invention to have used the two separate sensors taught by **Ohigashi et al.** in the method for determining the position of an image mark relative to the edge of the sheet taught by **Loffler** because the teachings of **Ohigashi et al.** allow for additional devices to accomplish the sensing of the edge and mark, which provides design

Art Unit: 2624

flexibility. Additionally, the substitution of the two sensors taught by **Ohigashi et al.** for the single scanner/sensor taught by **Loffler** reduces the cost of the method taught by **Loffler** because it eliminates the need for scanning the entire surface of the sheet.

Regarding claim 2, the claim rejection of claim 1 is representative of claim 2. See **Loffler** method teachings which include comparing the spaced distance of the mark, which has been calculated by the evaluation unit, with a prescribed nominal spaced distance (*column 4:lines 41-43, the image position data are checked against nominal values*), and emitting an output signal if the calculated spaced distance deviates from the nominal spaced distance by more than a prescribed value (*column 4:lines 43-48, if difference between calculated and nominal distances is outside the tolerance, i.e. deviates by more than a prescribed value, then position correction data are output, i.e. an output signal is emitted*).

Regarding 3, the claim rejection of claim 2 is representative of claim 3. See **Loffler** method teachings which include forming the output signal as a positioning signal, and feeding the positioning signal to an adjustment device (*fig 1, mother control 8*) for controlling positioning organs (*fig 1, front stop 22 and side stop 21*) for determining the position of the piece of printing material in the printing machine (*column 4:lines 43-48, if difference between calculated and nominal distances is outside the tolerance, i.e. deviates by more than a prescribed value, then position correction data are output to the adjustment device 8, i.e. an output positioning signal is emitted, which resets the positioning organs 21 and 22 to acceptable tolerances*).

Regarding claim 7, the claim rejection of claim 1 is representative of claim 7. See **Ohigashi et al.** method teachings which includes providing as the mark a reference mark for adjusting partial printing images (*column 5:lines 10-11, marks sensed by sensor 10 are registration marks*).

Art Unit: 2624

Regarding claim 8, the claim rejection of claim 1 is representative of claim 8. See **Loffler** method teachings which includes storing the spaced distance for taking it into account in a further processing of the piece of printing material (*column 4:lines 35-36, position data, i.e. space distance, is received by device for further processing, which inherently requires storing the distance in memory in order to enable data transfers*).

Regarding claim 9, the claim rejection of claim 1 is representative of claim 9. See **Loffler** method teachings which includes taking over the nominal spaced distance of the mark from the edge of the sheet by a printing stage (*column 4:lines 35-48, position data is reset to allowed distance, i.e. nominal distance is taken over*).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Loffler (US 6,429,945) & Ohigashi et al. (US 4,965,597) as applied to claim 1 above, and further in view of Foote et al. (US 6,008,826).

Regarding claim 4, **Loffler & Ohigashi et al.** teach the method according to claim 1, but do not teach the method which includes moving the piece of printed material past the first and the second optical sensor in a prescribed direction of motion and with a predetermined velocity, determining the spaced distance between the first and the second optical sensor in the direction of motion, determining the time span between acquiring the edge and acquiring the mark, and calculating a spaced distance of the edge from the mark, from the time span, the spaced distance between the optical sensors, and the velocity.

However, **Foote et al.** teach an alignment method which includes moving the piece of printed material past the an optical sensor (*fig 2, optical sensor 50*) in a prescribed direction of motion (*fig 2, prescribed motion 53*) and with a predetermined velocity (*column 6:line 4, speed of transfer belt 22*), determining the time span between acquiring a reference mark and acquiring another mark (*column 5:lines 34-43, timing error is determined between reference mark and another mark*), and calculating a spaced distance of the edge from the mark, from the time span, and the velocity (*column 6:lines 1-7,*

distance between the reference mark and the other mark is calculated by multiply the timing error by the predetermined speed of the belt).

Accordingly, it would have been obvious to use the distance calculation between two image elements as taught by **Foote et al.** in the method for determining the distance between an edge and image mark as taught by **Loffler & Ohigashi et al.** because it allows the recording sheet to travel through the printer while the adjustment is being made instead of having to stop the recording sheet for making an adjustment as taught by the adjustment method in **Loffler**.

In addition, determining the distance between the two sensors is not expressly taught by any one of or the combination of **Loffler, Ohigashi et al. and Foote et al.**

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to account for the direction of motion distance between the two sensors taught by **Ohigashi et al.** in the calculation of the distance between two image elements as taught by **Foote et al.**, otherwise the direction of motion distance calculation taught by **Foote et al.** would be off by the direction of motion distance between the two sensors taught by **Ohigashi et al.**

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Loffler (US 6,429,945) & Ohigashi et al. (US 4,965,597) as applied to claim 1 above, and further in view of Wantanabe et al. (US 6,128,106).

Regarding claim 5, **Loffler & Ohigashi et al.** teach the method according to claim 1, but do not teach a method which includes acquiring, by a third and a fourth optical sensor, an additional mark and the edge of the piece of printing material in vicinity of a side edge thereof disposed opposite the first and the second optical sensor, determining the spaced distance of the additional mark from the edge of the piece of printed material, comparing the spaced distance of the mark from the edge with the spaced distance of the additional mark from the edge, and emitting an output signal if the spaced distance of the mark from the edge and the spaced distance of the additional mark from the edge deviate from one another by more than a prescribed value.

However, **Watanabe et al.** teach an oblique motion detection system (*fig 3 A-C & column 3:lines 45-50*) that determines timing distances between two sensors 203 and 204 that sense the oblique movement of a sheet. **Watanabe et al.** teach making a correction, i.e. outputting a signal, if the timing differences are unacceptable, i.e. deviate from one another by more than a prescribed value.

Accordingly, it would have been obvious to one skilled in the art to have used the oblique motion detection and correction system taught by **Watanabe et al.** in the method taught by **Loffler & Ohigashi et al.** In combining the three inventions, each sensor of **Watanabe et al.** would consist of the edge sensor and mark sensor method taught by **Loffler & Ohigashi et al.** The oblique correction system of **Watanabe et al.** would correct timing deviations between the two sensor groups which would eliminate angular offset during positional correction as the recording material passes by the sensor groups.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Loffler (US 6,429,945) & Ohigashi et al. (US 4,965,597) as applied to claim 1 above, and further in view of deJong et al. (US 5,510,877).

Regarding claim 6, **Loffler & Ohigashi et al.** teach the method according to claim 1, but do not teach method which includes storing the spaced distance of the mark from the edge of a plurality of pieces of printed material, and determining a mean value for the spaced distance of the mark.

However, **deJong et al.** teach an image registration/alignment method for determining and controlling an image in a printing apparatus that stores registration data for multiple pages by continuously edge sensing for correcting alignment which would include several pages of image alignment, and then determining a moving average based on the registration data (*column 8:lines 13-32*).

Accordingly, it would have been obvious to one skilled in the art at the time of the invention to have used the moving average registration/alignment system taught by **deJong et al.** in the edge-to-mark distance correction taught by **Loffler & Ohigashi et al.** because it provides a consistent method for alignment subsequent images based on historical alignment data.

Claims 10, 12, 13 & 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loffler (US 6,429,945) & Ohigashi et al. (US 4,965,597) & Foote et al. (US 6,008,826).

Regarding claim 10, Loffler teaches a device for a printing machine (*fig 1, "Printing Machine"*), comprising:

a transport device for moving a piece of printing material in a prescribed direction of motion (*column 3:lines 60-61, sheet transport means (not shown)*);

an optical sensor (*fig 1, image scanner 23*) for acquiring a mark disposed on the piece of printing material material (*column 3:line 66 – column 4:line 5, image scanner 23 scans the electrical image, i.e. the entire sheet with marks comprising an image*);

an optical sensor (*fig 1, image scanner 23*) for acquiring an edge of the piece of printing material(*column 3:line 66 – column 4:line 5, image scanner 23 scans the electrical image, i.e. the entire sheet with edges of sheets*);

and an evaluation unit (*fig 1, steering or control device 14*), for calculating:

a spaced distance of the mark from the edge (*column 4:lines 37-41, evaluation unit 14 computes the exact position of the image with the parameter, i.e. the edge, of the sheet 11. The evaluation unit 14, in column 3:lines 10-13 & column 4:lines 41-43, measures the distance values to compare to a nominal distance*).

at least one of the velocity and the position of the piece of printing material (*column 4:lines 35-48, position of sheet is derived from positions of stops 21 and 22*)

Loffler does not teach wherein the sensing of the mark and the edge is accomplished by two separate sensors, one for sensing the mark disposed on the printed material and the other for sensing the edge of the printed material.

However, Ohigashi et al. teach one optical sensor for acquiring a mark disposed on a piece of printed material (*column 5:lines 10-16, mark sensor 10 senses registration marks on a recording paper 4*),

Art Unit: 2624

and another optical sensor for acquiring an edge of the piece of printed material (*column 5:lines 7-10, edge sensor 8 senses edge of a recording paper 4*).

Accordingly, it would have been obvious to one skilled in the art at the time of the invention to have used the two separate sensors taught by **Ohigashi et al.** in the method for determining the position of an image mark relative to the edge of the sheet taught by **Loffler** because the teachings of **Ohigashi et al.** allow for additional devices to accomplish the sensing of the edge and mark, which provides design flexibility. Additionally, the substitution of the two sensors taught by **Ohigashi et al.** for the single scanner/sensor taught by **Loffler** reduces the cost of the method taught by **Loffler** because it eliminates the need for scanning the entire surface of the sheet.

Furthermore, **Loffler & Ohigashi et al.** do not teach an acquisition unit for determining the velocity of the piece of printing material, nor do they teach wherein calculating the spaced distance between said mark and said edge is accomplished by using the chronological spacing between acquiring said edge and acquiring said mark, nor do they teach calculating the determined spaced distance between said first and said second optical sensor, said spaced distance being parallel to the direction of motion of the piece of printing material.

However, **Foote et al.** teach wherein calculating the spaced distance between said mark and said edge is accomplished by using an acquired velocity of the piece of printing material and the chronological spacing between acquiring said edge and acquiring said mark (*fig 2, the piece of printed material past the an optical sensor 50 in a prescribed direction of motion 53 and with a predetermined velocity, i.e. speed of transfer belt in column 6:line 4, and, column 5:lines 34-43, the timing error, i.e. chronological spacing between acquiring two sensed objects, is determined between reference mark and another mark*).

Accordingly, it would have been obvious to use the distance calculation between two image elements as taught by **Foote et al.** in the method for determining the distance between an edge and image mark as taught by **Loffler & Ohigashi et al.** because it allows the recording sheet to travel through the printer while the adjustment is being made instead of having to stop the recording sheet for making an adjustment as taught by the adjustment method in **Loffler**.

In addition, determining the distance between the two sensors is not expressly taught by any one of or the combination of **Loffler, Ohigashi et al. and Foote et al.**

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to account for the direction of motion distance between the two sensors taught by **Ohigashi et al.** in the calculation of the distance between two image elements as taught by **Foote et al.**, otherwise the direction of motion distance calculation taught by **Foote et al.** would be off by the direction of motion distance between the two sensors taught by **Ohigashi et al.**

Regarding claim 12, the claim rejection of claim 10 is representative of claim 12. See **Ohigashi et al.** wherein said first and said second optical sensor are disposed on one structural member or component (*fig 1, the two sensors are attached to an internal frame of the color recording apparatus. Also, since the sensors replace the scanner taught by Loffler, it follows that they would be disposed on the same structural member*).

Regarding claim 13, the claim rejection of claim 10 is representative of claim 13. See **Loffler** including a movement device for moving one of said first, said second, said third, and said fourth optical sensors (*column 3:line 66 – column 4:line 3, image scanner, i.e. first and second sensor scans, i.e., has a built-in movement device to scan the image*).

Regarding claim 14, the claim rejection of claim 10 is representative of claim 14. See **Ohigashi et al.** wherein one of said second optical sensor includes a transmitter and a receiver for monitoring an observation point, said transmitter serving for emitting a light signal impinging on said observation point (*fig 7, transmitter 30 and receiver 31*).

Art Unit: 2624

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Loffler (US 6,429,945) & Ohigashi et al. (US 4,965,597) & Foote et al. (US 6,008,826) as applied to claim 10 above, and further in view of deJong et al. (US 5,510,877).

Regarding claim 11, **Loffler & Ohigashi et al. & Foote et al.** teach the method according to claim 10, but do not teach method which includes storing the spaced distance of the mark from the edge of a plurality of pieces of printed material, and determining a mean value for the spaced distance of the mark.

However, **deJong et al.** teach an image registration/alignment method for determining and controlling an image in a printing apparatus that stores registration data for multiple pages by continuously edge sensing for correcting alignment which would include several pages of image alignment, and then determining a moving average based on the registration data (*column 8:lines 13-32*).

Accordingly, it would have been obvious to one skilled in the art at the time of the invention to have used the moving average registration/alignment system taught by **deJong et al.** in the edge-to-mark distance correction taught by **Loffler & Ohigashi et al. & Foote et al.** because it provides a consistent method for alignment subsequent images based on historical alignment data.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Loffler (US 6,429,945) & Ohigashi et al. (US 4,965,597) & Foote et al. (US 6,008,826) as applied to claim 14 above, and further in view of Watanabe et al. (US 6,128,106).

Regarding claim 15, **Loffler & Ohigashi et al. & Foote et al.** teach the monitoring device according to claim 14, but do not teach including a switch is provided that activating one of said first and said second transmitters.

However, **Watanabe et al.** teach two edge sensors 203 and 204 that sense the oblique movement of a sheet (*fig 3 A-C & column 3:lines 45-50*).

Accordingly, it would have been obvious to one skilled in the art to have used the two edge oblique motion detection and correction system taught by **Watanabe et al.** in the device taught by **Loffler & Ohigashi et al. & Foote et al.** In combining the three inventions, each edge sensor of **Watanabe et al.** would consist of the edge sensor and mark sensor method taught by **Loffler &**

Art Unit: 2624

Ohigashi et al., which includes the transmitter/receiver configuration taught by **Ohigashi et al.** The benefit of using the oblique correction system of **Watanabe et al.** is that it would correct timing deviations between the two sensor groups which would eliminate angular offset. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to share one receiver for the edge sensors instead of supplying separate receivers for each edge sensor because of the decreased cost

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kyle Pendergrass whose telephone number is **(571) 272-7438**. The examiner can normally be reached on Monday-Friday 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, King Poon can be reached on **(571) 272-7440**.



**KING Y. POON
PRIMARY EXAMINER**